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FOUNDERS MEET GROWING DEMANDS OF MACHINE-TOOL INDUSTRY; DEVELOP VACUUM-CASTING METHOD

TECHNOLOGICAL ADVANCES HELP BOOST OUTPUT -- Moscow, Moskovskaya Pravda, 11 Feb 51

The Moscow Stankolit Plant entered the postwar period with a lower productive capacity and fewer workers than it had before the war. Finding itself faced with the task of supplying castings for the rapidly growing machine-tool industry, it drew up a plan which called for an output of castings that would equal the prewar figure by the second year of the plan, and rise 32 percent above that by 1950.

Now, the Stankolit Plant not only supplies machine-tool plants, but must fill orders for tool and abrasives enterprises as well. The nature of orders submitted is, furthermore, extremely varied. One plant calls for 50-60 tons of castings a year, another one will require 500-600 tons, a third will order nearly 20,000 tons.

The plants placing the heaviest and most important orders are the Moscow Krasnyy Proletariy Plant and the Moscow Machine-Tool Plant imeni Ordzhonikidze. Before the war, each of these enterprises put out only a few types of machines: the Krasnyy Proletariy Plant produced a great number of DIP machine tools, and the Plant imeni Ordzhonikidze produced turret lathes. In the postwar period, these enterprises began building dozens of different extremely complex, heavy, special automatic and universal machines, as well as automatic machine tool lines. The Stankolit Plant must not only catch up to the production of these plants, but must overtake it, for the machine-tool plants must have the castings before they can start to build the machines.

Because of the new situation, the Stankolit Plant, originally set up for mass production, had to turn to the individual and small-series production of a considerable number of castings, putting out an increasing number of intricate and complex items. In 1950, they constituted 40.5 percent of the plant's entire output.

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Another problem was presented by the increasing speeds at which new machines were being put into production at the plants supplied. The cycles for the production of machine tools of new types were greatly shortened, with machines which formerly took 1½ years to put into production now going into series production within 7-8 months. Thus, the Stankolit Plant has had to run its own production at increasingly faster rates.

Finally, any analysis of the work of the Stankolit Plant must take into account the sharp increase in machine-tool builders' requirements for heavy castings. This is an important point, because the plant's shops were set up for closed production cycles, each of which was designed for output of castings within a limited weight group.

The need to adapt the plant to the production of a great number of small-series and individually produced castings called for a considerable effort from the workers. It can now be said, however, that the plant was successful in meeting the challenge. The plant increased its output of castings 98 percent during the Five-Year Plan, and not only completely met demands for parts cast from ordinary gray iron, but put out hundreds of tons of steel castings (after the production of these parts had been established in 1949), as well as thousands of tons of castings of superhard modified pig iron.

A number of technological measures taken by the plant with the help of its laboratory played an important role in helping it solve its problems. The chief of these was extensive mechanization of production processes. The plant built over 60 units of extra nonstandard equipment, including shot-blasting chambers, cleaning drums, shakeout grids and riddles, movable furnaces for drying molds, draw-type molding machines, and a cupola with a generator.

Individual production of heavy castings was mechanized in shop No 3 with the installation of a sand slinger for filling large flasks, a unit for surface drying the molds, and a conveyer for feeding molding sand.

A number of parts formerly cast in dry molds were switched to green sand molds which had been dried. Sand slingers replaced hand-molding operations, and patterns were mounted on plates. Many special fittings were made: flasks, mold boards, pattern complexes, pins, etc.

To raise the output of molding machines, the design and fittings were changed in a number of cases, increasing their size while maintaining the former weight. Now heavier molds can be made on these machines.

A great deal of work was carried on in setting up systems for the transportation of molds, parts, sand, and waste. The design of the sand-slinger impeller head was changed, and shakeout grids of 7.5 tons capacity were installed.

All these measures led to a 25-percent increase in the output of heavy castings during 1950.

The problem of casting rejects is an important one for any foundry. Many foundries consider production to be running well if 7-8 percent of the castings are unsound. For its part, the Stankolit Plant has met with remarkable success in the reduction of rejects. Despite the fact that the plant put into production 3,376 parts, for which new patterns had to be made, rejects have been steadily reduced. In the first quarter of 1950, rejects constituted only 6.7 percent of the total output; in the second quarter, the figure was cut to 5.7 percent; in the third quarter, it was only 4.5 percent; and in the fourth quarter, rejects were only 4.3 percent of the total production.

The quality of sound castings was also improved. While in 1949 only 26 percent of the castings produced were given the rating of "excellent quality," 65 percent of those produced in the fourth quarter of 1950 were rated excellent. Now, nearly two thirds of the parts shipped out are primer coated.

One of the most important technological advances in the plant has been the introduction of high-speed molding and core making. The plant was aided in this field by the Central Scientific Research Institute of Technology and Machine Building, which showed the workers how to use the quick-drying molding mixtures developed by the institute's scientists. Application of the new technology has made possible the elimination of a number of drying operations in the special furnaces, and has shortened the production cycle for heavy bench castings by 50 percent.

Recently, the technology of making castings of superhard iron was perfected, and a group of castings of this material turned out. Efforts are being made to attai. more complete combustion in the cupola process by enriching the blast with oxygen.

The Machine-Tool Institute imeni Stalin has helped the plant develop a high-speed method of making wooden patterns which has raised the labor productivity of the pattern makers. During 1950, 105 suggestions for technological improvements were put into practice, resulting in a saving of 1,700,000 rubles.

The technological and organizational measures put into effect in the plant during the past 5 years have affected its economic indexes. By comparison with 1940, gross production has grown 93.7 percent, while the cost of installed equipment has increased 61.6 percent. In evaluating these figures, it should be kept in mind that a considerable part of the capital outlay went into equipment of a nontechnological nature, that is, equipment which did not contribute directly to an increase in the production of castings, such as intake and exhaust blowers, and humidifiers. In evaluating the economic effect of the basic means of production, it may be noted that the output of finished products per 1,000 rubles of equipment cost has increased 20.7 percent during the last Five-Year Plan.

One of the most important nontechnological expenditures went into a special blower shop, which works on the problem of dust elimination throughout the plant. Equipment has been built and installed for precipitation of dust, and a method for removing dust from the castings with wet scrubbers has been developed. A 5-month period of experimentation conducted by the Institute of Labor Welfare showed the scrubbers to be entirely satisfactory, and in 1951 similar scrubbers will be installed in all areas where much dust is generated. -- P. Kuleshov, chief engineer, Stankolit Plant

TURN OUT CASTINGS WITH MINIMUM ALLOWANCES -- Moscow, Avtomobil'naya i Traktornaya Promyshlennost', Jan 51

A new method for casting bronze sleeves has been developed which utilizes a permanent metal mold, called a crystallizer. This mold is surrounded by a circulating-water cooling jacket.

In casting a sleeve, the mold is first lubricated, and a sand core inserted. The mold is then swung over a bath of molten bronze, and the open bottom lowered into the bath. An electric vacuum pump then exhausts the air from the mold, and the molten bronze is drawn up into it. The mold is then swung away, and the casting removed.

The sleeves cast by this machine have better mechanical qualities and lower allowances than those cast by ordinary methods. Thus, less subsequent machining is required, and considerable metal is saved.

TEST PERMANENT MOLD MACHINE -- Moscow, Vechernyaya Moskva, 28 Feb 51

The machine-tool-building shop of the Heating Fittings Plant imeni Voykov has built many original foundry machines.

The plant has just completed tests on a new machine, designed to turn out shaped castings in permanent metal molds. It measures 5 meters in diameter, and is completely mechanized for all the casting processes. The castings do not require subsequent machining.

Compared with hand methods, the machine is four times as productive.

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